



May 29, 2018

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**Re: Response to Tucson Audubon Society and Native Seed Search Comment Letters  
Rosemont Copper Project, Clean Water Act Section 404 Permit, CoE File No.: 2008-00816-MB**

Dear Mr. James and Ms. Cummings:

The U.S. Army Corps of Engineers (Corps) transmitted a copy of unsolicited comments from the Tucson Audubon Society and Native Seed Search regarding the Proposed Rosemont Copper Project (Rosemont) mitigation plan at Sonoita Creek Ranch. Rosemont and its technical consultants Water and Earth Technology have reviewed the document.

Rosemont specifically notes the concerns regarding sediment transport from Sonoita Creek downstream that were raised in prior comments made by EPA that were fully addressed by Rosemont. The concerns these comments have generated appear to be based primarily on the language used in EPA's comments and not on the substance. As you know, Sonoita Creek is a transport limited stream which regulates the volume of sediment that can be carried downstream. The current state of Sonoita Creek, an incised channel with no sinuosity creates a situation where sediments move through the system without the benefit of creating a natural bed and bank. This has created an unnatural system at Sonoita Creek Ranch.

Our responses to these comments are in the attached documents. If you have questions or require further information regarding this topic, I can be reached at (520) 495-3502 or via email at [kathy.arnold@hudsonbayminerals.com](mailto:kathy.arnold@hudsonbayminerals.com).

Regards,

A handwritten signature in black ink, appearing to read "Katherine Ann Arnold".

Katherine Ann Arnold, PE  
Director, Environment

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**Rosemont Response to EPA Comments  
February 1, 2018**

Attach: *Response to Tucson Audubon Society and Native Seed Search, Comments on Habitat Mitigation and Management Plan for Rosemont Copper Company, May 24, 2018*

cc: File

*Doc. No. 023/18-15.2.1*

# **RESPONSE TO TUCSON AUDUBON SOCIETY AND NATIVE SEED SEARCH**

Comments on Habitat Mitigation and Management Plan for  
Rosemont Copper Company

Prepared for:

Rosemont Copper Company  
5255 East Williams Circle, Suite 1065 • Tucson, Arizona 85711

May 24, 2018

Prepared by:



and

**HUDBAY**

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## INTRODUCTION

In a letter dated May 4, 2018 and in a nearly identical letter dated May 10, 2018, Tucson Audubon Society and Native Seed Search provided unsolicited comments to the U.S. Army Corps of Engineers (Corps) regarding the Rosemont Copper Project (the Rosemont Project or Project) mitigation plan for Sonoita Creek Ranch. In this report, we address these.

The Tucson Audubon Society (TAS) owns and operates the Paton Center for Hummingbirds (The Center), a bird sanctuary and study site in Patagonia, AZ, downstream of the proposed Sonoita Creek Ranch (SCR) Project. Similarly, Native Seed Search (NSS) owns and operates a Conservation Farm (Farm) downstream of the proposed SCR Project. Both TAS and NSS have submitted letters to the Corps raising concerns regarding the SCR Project. Both groups raised concerns about negative impacts to their properties from implementing the Final Habitat Mitigation and Monitoring Plan (HMMP), specifically from construction of the SCR Project. The concerns expressed are listed below:

1. Impacts to the Center and the Farm from environmental disruption during construction
2. Impacts to the Center and the Farm from changes to sediment transport
3. Vegetation re-establishment at the Project site after construction & the risk that non-native species will establish in areas disturbed by construction
4. Statements from third parties (the EPA and an independent consultant to Save the Scenic Santa Ritas) about the HMMP's mitigation goals and about the risk of failure for the restored channel
5. The need for a supplemental EIS to address HMMP including downstream impacts of implementing the HMMP
6. The risk of depleting the local water table

The concerns are for the most part a repetition of concerns originally voiced by EPA and Save the Scenic Santa Rita's that have already been refuted by Rosemont (Westland and WET, 2018). This document reiterates and responds to each broad concern outlined in the letters to the Corps.

### **I. Environmental Disruption During Construction**

Both groups quote from an argument originally made by EPA's contractors that "excavation of 300,000 cubic yards of spoil is a massive undertaking, with inevitable impacts of heavy equipment compacting sensitive soils, disrupting the existing topography, etc." For some perspective, restoration of Sonoita Creek will include temporary disturbance of about 200 acres of land, while Sonoita Creek's contributing watershed at The Center is over 88,000 acres. The watershed at the Farm is slightly less than that. In other words, construction of the SCR project will temporarily disturb 0.2% of the Sonoita Creek watershed upstream of the Center, for the purpose of improving the long-term ecological and hydrologic functioning of the restored channel.

The Arizona Department of Environmental Quality (ADEQ) has reviewed both the mitigation plan and public comments and concluded that no adverse impacts to Sonoita Creek are expected from implementing the restoration plan. Sediment and erosion controls will be implemented during and following construction of the restoration project as required by the 401 Water Quality Certification

granted by ADEQ. Construction at Sonoita Creek will adhere to all of the General Conditions and to Special Conditions 5 through 33 of the 401 Water Quality Certification. These conditions require construction to occur without causing exceedances to surface water quality standards. Construction of the restored channels will proceed from downstream to upstream, so that existing Sonoita Creek will continue to convey any discharge until the entire restored channel is constructed. As project construction moves upstream, each area shall be rough graded, top-soiled, seeded, and mulched before moving onto the next area. This will minimize the amount of disturbed and exposed soil at any given time. Construction shall furthermore be timed to avoid the summer monsoons, which greatly reduces the likelihood that a significant flow event even occurs during construction.

It is important to understand the current state of the floodplain at Sonoita Creek Ranch, which includes an overgrazed agriculture field as well as some Sacaton grassland. The grazing system in place is generally continuous grazing by some cattle, but primarily by horses. The horses overgraze the ranch much more severely than cattle due to their ability to graze grass to a much shorter height. Since the ranch is continuously grazed, with little to no rest, the result is a denuded floodplain/ranch area (see Figure 1). Overgrazing has resulted in a lack of vegetation, which leads to: increased soil temperatures, adverse impacts to soil ecology and soil structure, and impaired habitat. The overgrazing at Sonoita Creek is representative of continuous, long-term disturbance to the floodplain, without sediment controls, and without a rest period for flora and fauna to recover. In contrast, restoration construction at Sonoita Creek will be for a relatively short duration, will include sediment controls as required by ADEQ and the Corps, and the grazing pressure will be removed allowing the site to revegetate completely.





**Figure 1. Grazing and lack of vegetation**

In summary, no adverse impacts to downstream water quality at The Center or the Farm are expected given the construction sequence and sediment and erosion controls during construction, and also because the temporary disturbance at SCR involves a very small fraction of the watershed upstream of The Center. ADEQ has reviewed the mitigation plan and concurs that no adverse impacts are expected downstream resulting from this restoration project and has issued a 401 Water Quality Certification for the work. Sediment controls and best management practices shall be utilized during construction as required by ADEQ and the Corps to prevent exceedances to surface water quality standards.

**II. Sediment Transport**

Both groups quote the HMMP, which indicates that the “first few storms will mobilize a significant volume of sandy material and cobbles.” There is no elaboration of a specific concern about sediment transport, but it is presumed they are concerned with negative downstream impacts resulting from sediment transport.

For clarification, Sonoita Creek is a transport-limited ephemeral stream, essentially the sediment supply is never fully evacuated due to the infrequency and short duration storm events. Because of this every significant stormflow event will transport a significant volume of sandy material and cobbles. Sediment will episodically move downstream in pulses based on conditions during runoff events. The restoration efforts at SCR will ultimately result in conditions that mitigate erosion potential, making negative downstream impacts highly unlikely for these reasons:

- Construction will occur from beginning to end (initial excavation to seeding and mulching) in unit areas, thereby minimizing the temporary exposure of disturbed soils.
- The flat valley floor adjacent to the channel inherently favors deposition over erosion, capturing and storing sediments moving into the valley from the uplands.
- The wider and slightly flatter restored channel will have lower specific stream power (a.k.a. erosion potential) than the existing incised channel and will significantly reduce the contribution of sediments to the stream from the collapse of unstable, incised banks.
- Incipient motion analyses presented in the HMMP indicate that sediment will continue to move through the system.

Sediment transport in Sonoita Creek adjacent to the Farm and the Center – as it is all along the Creek – is largely dependent on local channel characteristics {shape, gradient, soil texture(s)} and runoff conditions (flow rate, flow duration) that will not change as a result of the SCR Project. Because the upstream reach of Sonoita Creek is and will continue to be transport limited, and because of robust sediment management during construction, there is no mechanism by which the restoration of Sonoita Creek could produce long-term changes in the sediment transport regime at the Center or the Farm. Runoff conditions at both locations will continue to be driven by storm-specific conditions including the spatial and temporal rainfall distribution, and surface conditions such as cover and antecedent moisture condition. The restoration at SCR will temporarily modify cover conditions for less than 0.2 percent of the total drainage area reporting downstream, without

changing the large-scale weather patterns that will dictate flow and sediment transport events. Thus, concerns about downstream impacts to or by sediment transport in Sonoita Creek resulting from implementing the HMMP are unfounded.

### **III. Vegetation Re-Establishment**

Both groups inaccurately cite the HMMP by implying that desired vegetation will not be established for 15 years, supporting this view by incorrectly stating that no supplemental irrigation will be provided during the restoration effort. Later, both also write that non-native invasive species including Bermuda grass and Johnson grass will proliferate at the mitigation site and downstream resulting from the temporary disturbance.

While the HMMP notes that establishment of Mesquite/Sacaton grassland woodland is a realistic target state in 15 years, it did not state that it will take 15 years for desirable vegetation to be established. The HMMP proposes a 15-year monitoring plan, which is 50% longer than a typical 10-year monitoring plan for projects of this type. The HMMP explicitly lists vegetation performance standards for the project that are subdivided into three 5-year milestones for the 15-year monitoring period, and by Year 5 there shall be at least 50% relative cover of native species.

Rosemont has already taken steps to maximize the success of restoring the Sacaton grasslands. Recently, in preparation for Sacaton seed and plant harvesting, a region of Sacaton grassland was mowed to remove the large volume of dead and lignified grass and to stimulate plant growth (Figure 2). Sacaton regrowth is stimulated by the mowing activities and will be much more robust and uniform during construction. The Sacaton seed harvested on-site from the regrowth will be more viable (and locally-adapted) for use in the reclamation seed mixture. Furthermore, the Sacaton stimulated by mowing now will be more successful as transplants.

Contrary to speculation that supplements including irrigation, will not be used and native plants will not survive, the HMMP does in fact include initial supplementation for native plants. Soil amendments are proposed for replaced topsoil, and furthermore, DriWater™ supplemental irrigation packs will be installed with the transplanted species and recharged as needed during initial reclamation. Competent weed-free Woodstraw™ mulch will moderate soil temperatures and provide an environment conducive to early plant growth. Over the course of the extended, 15-year monitoring period, Rosemont will be responsible for undertaking and documenting successful reclamation of the SCR Project disturbance area with native species as part of the HMMP provisions.





**Figure 2I. Sacaton Grassland Mowing Operation**

Concerns expressed by both groups about non-native species invading the site after construction applies to disturbed areas that are not managed for native vegetation reclamation. It is true that Bermuda grass and Johnson grass are already prevalent in the abandoned agricultural field. The long history of farming and overgrazing has promoted these species. The Johnson grass-colonized areas at SCR are mapped and will be chemically controlled this fall prior to construction. Weed control will continue as needed after construction through the 15-year monitoring period. Given that the non-native species of concern specifically noted by both groups are already prevalent on-site, and that no weed control measures have been implemented until now, this mitigation project is far more likely to suppress non-native species than to promote them on-site and downstream.

#### **IV. Mitigation Goals are Inappropriate for the Site According to the EPA**

Both groups note that EPA pointed out that mitigation goals are inappropriate for the site, and also notes that the agricultural field is already returning to Sacaton and mesquite. While the mesquite is colonizing the abandoned agricultural field, very little Sacaton is reestablishing in the field currently dominated by weedy annuals and undesirable perennial grass species. Johnson grass colonies have been mapped this spring for fall 2018 herbicide treatment prior to construction activities. Bermuda

grass occurrence is so ubiquitous in the Sonoita valley that control of this invasive species is not ecologically possible due to the existing seedbank and upstream seed sources out of the control of Rosemont.

More specifically, the EPA's comments were fully addressed in the Response to the Environmental Protection Agency (2017) prepared by WestLand Resource, Inc. dated January 24, 2018. As stated in the conclusion,

*The CWA Section 404 compensatory mitigation package for the Rosemont Project represents a robust and rare opportunity to complete landscape-scale restoration of an ephemeral stream system in southern Arizona. Comments by the EPA (2017) overlook or ignore the flexibility inherent in the 2008 Mitigation Rule and the SPD guidance, and fail to acknowledge the significant opportunity afforded by this mitigation plan. The responses provided here aptly demonstrate that the mitigation plan is well considered and rooted in accepted scientific and engineering principals, and may well serve as a model for future restoration efforts in arid land systems.*

## **V. Need for a Supplemental EIS to Address the HMMP**

The HMMP, including downstream impacts associated with implementing the HMMP, is not a significant enough change to merit a supplemental EIS. The Rosemont Project has had a full EIS completed by the Forest Service that included discussion of mitigation and review of mitigation impacts, which included conservation efforts at Sonoita Creek Ranch. As discussed above, the downstream impacts caused by implementing the HMMP are marginal. Given this, there is no basis to require a supplemental EIS based on the HMMP. Rosemont understands that the Corps will evaluate and document its decision to approve the HMMP consistent with its NEPA obligations.

## **VI. Depleting the Local Water Table**

Both groups also speculate that revegetation efforts at SCR will fail, prompting unplanned irrigation that will deplete the local water table and cause existing wells to fail.

As discussed earlier, this restoration project does include supplemental irrigation via DriWater™ gel packs, and the disturbed soils will be protected with wood straw mulch that will moderate soil temperatures, retain moisture, and prevent erosion.

Another important aspect of this restoration project is the reconnection of Monkey Spring to Sonoita Creek. Monkey Spring was severed from Sonoita Creek long ago to irrigate the agricultural fields. Flow measurements over the past 70 years support the long-term persistence of flow from this water source (Westland and WET, 2018). The significant average flow rate of 509 gallons per minute (821 acre-feet per year) supports the expectation that re-establishing the connection between Monkey Spring and Sonoita Creek will result in stronger and more diverse riparian vegetation, groundwater recharge, and a more resilient ecosystem. For perspective, the annual groundwater pumping from the Cienega Creek Basin (which underlies the reach of Sonoita Creek passing through Sonoita Creek Ranch and downstream through Patagonia) is estimated at 1,200 acre-feet per year (ADEQ, 2012), only slightly higher than the average annual flow rate of Monkey Spring of 821 acre-feet per year. Water supply from Monkey Spring is significant relative to total groundwater use in the basin. Therefore, re-establishing the Monkey Spring connection to Sonoita Creek has the

potential to significantly enhance groundwater recharge to the Cienega Creek Basin (groundwater basin).

Given the construction methods proposed at SCR, a total failure of revegetation is extremely unlikely. TAS has reported that they have planted thousands of grasses, shrubs, and trees, which have succeeded and are described to be providing valuable habitat. Rosemont has the expertise and has sufficient resources to accomplish successful restoration of Sonoita Creek. Rosemont has already taken steps to ensure reclamation success such as mapping the invasive species that will be targeted for chemical control, preparing Sacaton grass for seed and plant harvesting, and extensive study of the site.

For the sake of argument, if the entire 200 acres of restoration construction were to experience a complete failure of seeding and transplanting, the area could be reseeded and irrigated using Rosemont's share of the flow from Monkey Spring alone, without any groundwater pumping. Monkey Spring provides enough water to apply over 48 inches of irrigation water to the restored acreage annually, without pumping from the local water table. Any suggestion that restoration proposed at Sonoita Creek could deplete the local water table is not supported by reason and requires a great deal of speculation.

## **THE TUCSON AUDUBON SOCIETY CENTER AND NATIVE SEED SEARCH FARM**

Both groups are located in the town boundaries of Patagonia, Arizona (Figure 3). TAS is adjacent to the most urban portion of that small town while Native Seed Search is to the north and east of the town along a recreational trail and near housing and farming. Adverse impacts are far more likely to result from human/wildlife conflicts within Patagonia than to result from restoration activities along Sonoita Creek 3.5 or more miles away.

Adverse impacts to the Center (which are generally considered adverse impacts to birds in North America) are most likely to result from climate change and habitat fragmentation. The TAS website (<http://tucsonaudubon.org/go-birding/tucson-audubons-paton-center-for-hummingbirds/654-2/>) specifically discusses the need for Sonoita Creek Restoration,

*"... much of the creek is choked with invasive species, the water table is dropping, banks are eroding, and the majestic cottonwoods are not recruiting a new generation. The understory in many areas forms dense areas of Johnsongrass and vinca – neither [sic] providing habitat for most birds and crowding out the incredible biodiversity of native grasses, shrubs, and pollinator plants that are associated with the amazing birds folks travel from all around the world to see."*

These are the type of conditions along the Creek that the HMMP is designed to address.

Conversely, NSS specifically discusses their plans on their website (<https://www.nativeseeds.org/our-approach/conservationfarm>),

*"On December 19, 1997, NS/S and The Nature Conservancy (TNC) each purchased a portion of a 160-acre farm in Patagonia, Arizona. NS/S bought 60-acres of rich flood plain fields **away from the creeks** and TNC purchased the remaining 100 acres of farm, including the creek bottom and neighboring corridor of native Sacaton grass and cottonwood trees. While TNC would work to preserve the Sonoita Creek riparian*



*corridor running through its newly acquired land, NS/S would use the flood plain fields to grow and conserve native crops.” [emphasis added]*

NSS also states that invasive species, as well as the distance from Tucson, cause the most problems for completion of their mission. While we cannot control distance from Tucson, the control of invasives and preservation of Sacaton grass and cottonwood trees play heavily into Rosemont's plans.

The restoration proposed for Sonoita Creek cannot mitigate the location chosen by the groups near an urbanized area, but it will constitute a significant barrier to habitat fragmentation and provide for control of invasives upstream. Rosemont has already purchased 33 land parcels subdivided from the Sonoita Creek valley, so that a total of 1,580 acres will now remain as an intact habitat corridor.



**Figure 3. The Center Located at Patagonia, Arizona**

## SUMMARY

The concerns of both groups are largely drawn from letters by the EPA and Save the Scenic Santa Ritas. These documents contain numerous misunderstandings and unsubstantiated opinion about the SCR mitigation project, which have been refuted by Rosemont and their consultants in other

documents. Implementing the mitigation plan at Sonoita Creek will result in a more dynamic and ecologically functional Sonoita Creek.

The mitigation plan to restore Sonoita Creek will provide ecological benefit at the watershed scale and provide additional groundwater recharge by reconnecting Monkey Spring to Sonoita Creek. The SCR project site has tremendous potential for improved ecological value, with a seriously degraded starting point and an endpoint that will make it an ecological asset to the region. The Corps guidelines for compensatory mitigation recommend undertaking mitigation projects in areas that are obviously degraded by man, which provide a high likelihood of improvement through a compensatory mitigation project. The SCR Project certainly qualifies as such a project.

## REFERENCES

- Arizona Department of Environmental Quality (ADEQ). 2012. Ambient Groundwater Quality of the Cienega Creek Basin: A 2000-2001 Baseline Study – November 2012. Publication Number: FS 12-05.
- Native Seed Search, Conservation Farm. On the web at <https://www.nativeseeds.org/our-approach/conservationfarm>, last accessed 5/22/2018
- Tucson Audubon Society, Patton Center for Butterflies, Sonoita Creek Restoration. On the web at <http://tucsonaudubon.org/go-birding/tucson-audubons-paton-center-for-hummingbirds/654-2/>, last accessed 5/22/2018
- WestLand Resources, Inc. 2018. *Response to Environmental Protection Agency (2017) "The Mitigation Proposed by Rosemont Mine Will Not Offset Impacts to Waters of the U.S. below the Level of Significant Degradation."* Prepared for Rosemont, January 19, 2018.